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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,195	04/02/2004	Maria Clemens Y. Quinones	018865-014800US	2168

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EXAMINER

LEE, PATRICK J

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/817,195	Applicant(s) QUINONES ET AL.	
	Examiner Patrick J. Lee	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-25 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to amendment filed January 23, 2006.

Claim Objections

2. Claim 25 is objected to because of the following informalities: The preamble of the dependent claims should be consistent. Claim 25 is a pseudo-independent claim and in order to overcome this objection, applicant should explicitly import all the elements of claim 24 into claim 25. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 & 4-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,603,183 B1 to Hoffman in view of US 4,124,860 to Johnson.

With respect to claim 1, Hoffman discloses an image sensor comprising: substrate (102) formed of pre-molded plastic (104, 106) on lead frame (116, 120, 122) (see column 3, lines 59-61) as a substrate comprising a lead frame and a molding compound; image sensor (108) as an optical receiver where the optical receiver is electronically coupled to lead frame (116, 120, 122); and bond wires (118) that have heights greater than the height of the optical receiver (108) and are solder structures disposed within encapsulant (119). However, Hoffman does not disclose the use of an optical emitter and an optically transmissive medium. Johnson discloses such in an optical coupler comprising: light emitter (10) as an optical emitter; wire (11) as a conductive structure having a height greater than that of the light emitting unit and an analogue to bond wires (118) disclosed by Hoffman; and optical transmissive medium (21) disposed between the emitter (10) and receiver (20). To modify the teachings of Hoffman with those of Johnson would have been obvious to one of ordinary skill in the art to give the image sensor device taught by Hoffman the ability to emit light that would be appropriate for the detected and imaged object and because both Hoffman and Johnson are in the field of optical packaging.

With respect to claim 4, the modified Hoffman discloses the use of bond wires (118, 11) to couple the optical receiver and the optical emitter to the lead frame.

With respect to claims 5 & 8, the modified Hoffman discloses the lead frame (116, 122, 120) to have both etched and non-etched portions, where the non-etched portions are open and not covered by plastic (104, 106).

With respect to claim 6, the modified Hoffman does not explicitly disclose the lead frame to comprise copper, but such would have been obvious to one of ordinary skill in the art because copper would allow for accurate transmission of a detected signal.

With respect to claim 7, the modified Hoffman does not explicitly disclose a plurality of optocouplers, but such would have been obvious to one of ordinary skill in the art as mere duplication of parts.

With respect to claim 9, the modified Hoffman discloses the method of forming the device comprising: formation of a substrate (102) first through the step (202); mounting of electrical components (204) as a step attaching an optical emitter and receiver to the substrate; and then the deposition of light transmitting material (21) over the emitter and receiver.

With respect to claim 10, the modified Hoffman discloses the use of bond wires (118, 11) to couple the optical receiver and the optical emitter to the lead frame as conductive structures having heights greater than those of the optical emitter and optical receiver.

With respect to claim 11, the modified Hoffman suggests that the lead frame be etched before disposed in the pre-molded plastic.

With respect to claim 12, the modified Hoffman does not explicitly disclose the lead frame to comprise copper, but such would have been obvious to one of ordinary skill in the art because copper would allow for accurate transmission of a detected signal.

With respect to claim 13, the modified Hoffman discloses the use of bond wires (118, 11) to couple the optical receiver and the optical emitter to the lead frame.

With respect to claim 14, the modified Hoffman does not explicitly disclose the use of an opaque material, but such would have been obvious to one of ordinary skill in the art in order to improve the optical coupling ability of the device.

With respect to claim 15, the modified Hoffman does not explicitly disclose the plurality of emitters and receivers, but such would have been obvious to one of ordinary skill in the art because such would be mere duplication of parts.

With respect to claims 16 & 18, Hoffman discloses an image sensor comprising: substrate (102) formed of pre-molded plastic (104, 106) on lead frame (116, 120, 122) (see column 3, lines 59-61) as a substrate comprising a lead frame and a molding compound; image sensor (108) as an optical receiver where the optical receiver is electronically coupled to lead frame (116, 120, 122); and bond wires (118) that have heights greater than the height of the optical receiver (108) and are solder structures disposed within encapsulant (119). However, Hoffman does not disclose the use of an optical emitter and an optically transmissive medium. Johnson discloses such in an optical coupler comprising: light emitter (10) as an optical emitter; wire (11) as a conductive structure having a height greater than that of the light emitting unit and an

analogue to bond wires (118) disclosed by Hoffman; and optical transmissive medium (21) disposed between the emitter (10) and receiver (20). To modify the teachings of Hoffman with those of Johnson would have been obvious to one of ordinary skill in the art to give the image sensor device taught by Hoffman the ability to emit light that would be appropriate for the detected and imaged object and because both Hoffman and Johnson are in the field of optical packaging. Also, while the modified Hoffman does not explicitly disclose the plurality of emitters and receivers, but such would have been obvious to one of ordinary skill in the art because such would be mere duplication of parts.

With respect to claim 17, the modified Hoffman discloses the lead frame (116, 122, 120) to have both etched and non-etched portions, where the non-etched portions are open and not covered by plastic (104, 106).

With respect to claims 19-20, the modified Hoffman does not explicitly disclose the use of a MOSFET, but such would have been obvious to one of ordinary skill in the art as light receivers and emitters are capable of being MOSFETS due to their ability to perform and their relatively low cost in manufacture.

With respect to claim 21, Hoffman discloses an image sensor comprising: substrate (102) formed of pre-molded plastic (104, 106) on lead frame (116, 120, 122) (see column 3, lines 59-61) as a substrate comprising a lead frame and a molding compound; image sensor (108) as an optical receiver where the optical receiver is electronically coupled to lead frame (116, 120, 122); and bond wires (118) that have heights greater than the height of the optical receiver (108) and are solder structures

disposed within encapsulant (119). However, Hoffman does not disclose the use of an optical emitter and an optically transmissive medium. Johnson discloses such in an optical coupler comprising: light emitter (10) as an optical emitter; wire (11) as a conductive structure having a height greater than that of the light emitting unit and an analogue to bond wires (118) disclosed by Hoffman; and optical transmissive medium (21) disposed between the emitter (10) and receiver (20). To modify the teachings of Hoffman with those of Johnson would have been obvious to one of ordinary skill in the art to give the image sensor device taught by Hoffman the ability to emit light that would be appropriate for the detected and imaged object and because both Hoffman and Johnson are in the field of optical packaging. Also, the modified Hoffman discloses the lead frame (116, 122, 120) to have both etched and non-etched portions, where the non-etched portions are open and not covered by plastic (104, 106).

With respect to claim 22, the modified Hoffman does not explicitly disclose the lead frame to comprise copper, but such would have been obvious to one of ordinary skill in the art because copper would allow for accurate transmission of a detected signal.

With respect to claim 23, the modified Hoffman discloses that the optical emitters and optical receivers are not on the etched regions of the lead frame.

With respect to claim 24, the modified Hoffman discloses the use of bond wires (118, 11) to couple the optical receiver and the optical emitter to the lead frame as a plurality of solder structures.

With respect to claim 25, the modified Hoffman does not explicitly disclose the use of a printed circuit board as claimed, but such would have been obvious to one of ordinary skill in the art in order to give the device the functionality required.

Response to Arguments

6. Applicant's arguments with respect to claims 1 & 4-25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J. Lee whose telephone number is (571) 272-2440. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

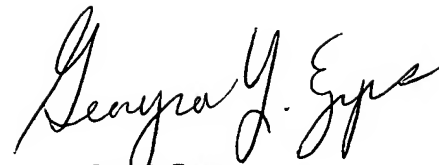
Patrick J. Lee

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Examiner
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PJL
February 23, 2006

A handwritten signature in cursive script, reading "Georgia Epps".

Georgia Epps
Supervisory Patent Examiner
Technology Center 2800